AVICENNIA NITIDA (NOMENCLATURE)

Elbert L. Little, Jr.

The common black-mangrove of tropical American shores has long been known as Avicennia nitida Jacq. Recently W. T. Stearn has proposed for this species the new combination A. germinans (L.) Stearn. However, the binomial A. germinans L. was validly published by Linnaeus nearly two hundred years earlier for a larger group with broader circumscription. Thus, A. nitida Jacq., in almost universal use for two hundred years, remains the correct name.

The nomenclature is of special interest, because this species is mentioned in numerous floras and publications about vegetation and forests, generally as A. nitida. Moldenke (Phytologia 7: 165-168, 179-181. 1960) cited many references.

This common species is the most widely distributed and hardiest of the New World mangroves. It extends the farthest north in the United States to Texas, Louisiana, and Mississippi, as well as to northern Florida, while the other three native mangrove species are restricted to southern and central Florida. On the Atlantic Coast this species ranges from Bermuda, Bahamas, and northern Mexico south to Brazil (Espirito Santo) and on the Pacific Coast from northern Mexico south to northern Peru and Galápagos Islands. The range is usually stated to include western Africa also. However, Moldenke (Phytologia 7: 149, 1960) refers the west African plants to A. africana P. Beauv., which is "admittedly very closely related."

The genus Avicennia L. was revised by R. C. Bakhuizen van den Brink (Revisio Generis Avicenniae (cum annotationibus diversis). Buitenzorg Jard. Bot. Bul. ser. 3, 3: 199-223, illus. 1921). A recent monograph is by Harold N. Moldenke (Materials toward a monograph of the genus Avicennia. I-III. Phytologia 7: 123-168, 179-232, 259-293. 1960). This genus usually is placed in the family Verbenaceae, though Moldenke and some others accept the segregate family Avicenniaceae with this single genus.

Avicennia L. (Sp. Pl. 110. 1753; Gen. Pl. ed. 5, 49. 1754) honors Abu Sina, or Avicenna (980-1036), of Bokhara, a distinguished Arabian physician and philosopher. The generic name was first proposed in 1735 by Linnaeus (Syst. Nat. ed. 1 (folio). 1735; ed. 2, 18. 1740) without description as a new name for Rheede's "Oepata RM" and was placed in Tetrandria Monogynia. In the generic description, Linnaeus (Gen. Pl. ed. 1, 27. 1737) cited Rheede's Hortus Indicus Malabaricus (4: t. 45. 1683) and

included this description of the seed, which was repeated in later editions (Gen. Pl. ed. 5, 49. 1754): "SEM: unicum, compressum, ellipticum, germinans intra pericarpium." Avicennia was mentioned also in other publications by Linnaeus (Flora Zeylanica 23. 1747; Materia Medica 42. 1749).

In 1753, the starting point of botanical nomenclature, the genus had a single species, A. officinalis L. (Sp. Pl. 110. 1753), of India. This name, according to W. T. Stearn (Kew Bul. 1958: 35. 1958), is to be typified by "Oepata" Rheede (1683) with restricted type-locality the coast of Cochin, southern India. The Linnaean Herbarium in London has specimens of this species and A. nitida, as cited by Spencer Savage (A catalogue of the Linnaean Herbarium. 225 p., illus. 1945). I have seen the new microfiches of these specimens and in 1956 photographed the two flowering specimens of A. nitida (813.1, 813.2).

The essential synonymy of the common New World black-mangrove is given below. Additional later synonyms were cited in the two monographs.

AVICENNIA NITIDA Jacq. black-mangrove

Bontia germinans L., Syst. Nat. ed. 10: 1122. 1759.
Avicennia nitida Jacq., Enum. Pl. Carib. 25. 1760; also Select. Stirp. Amer. Hist. 177, t. 112, fig. 1. 1763.
Avicennia tomentosa Jacq., Enum. Pl. Carib. 25. 1760; also Select. Stirp. Amer. Hist. 178, t. 112, fig. 2. 1763.
Bontia germinans L., Sp. Pl. ed. 2, 891. 1763 (in part).
Avicennia germinans L., Sp. Pl. ed. 3, 891. 1764(in part).
Avicennia germinans P. Br., Civ. Nat. Hist. Jamaica (ed. 2), Index I[p. 12], II[p. 7]. 1789.
Avicennia germinans (L.) Stearn, Kew Bul. 1958: 34. 1958.

All the works by Linnaeus and Jacquin cited above should be considered individually in chronological order. Linnaeus interpreted this species differently in each of four important books published within the five-year period 1759 to 1764.

Patrick Browne (Civ. Nat. Hist. Jamaica 263. 1756) called this species the olive mangrove tree, described it clearly in both Latin and English, observed that the seed "swells and germinates before it falls," and described the seed in Latin as follows: "Unicum quadrilobum germinans, lobis foliaceis." This work, which did not adopt binomial nomenclature, put this species doubtfully alone in the genus "BONTIA?". B. daphnoides L. was not mentioned.

The first binomial applied to the common black-mangrove of the New World was Bontia germinana L. (Syst. Nat. ed. 10, 2: 1122. 1759) as "A. B. fol.oppositis, pedunculis spicatis." Index Kewensis gave a later citation (L., Sp. ed. 2, 891. 1763)

and listed this name as a synonym of A. officinalis L. The genus Bontia [Plum.] L. (Sp. Pl. 638. 1753; Gen. Pl. ed. 5, 285. 1754), of Linnaeus's Didynamia Angiospermia and the family Myoporaceae, now has a single species, Bontia daphnoides L. (Sp. Pl. 638. 1753). In a family otherwise limited to the Old World, this species was described from Barbados and is found along shores in the West Indies and northern South America. The specimen of Bontia daphnoides in the Linnaean Herbarium (812.1) is sterile.

W. T. Stearn (A key to West Indian mangroves. Kew Bul. 1958: 33-37. 1958) noted that under Bontia germinans L. (1759) were two references, "Brown. jam. 263. Loefl. hisp. 193" the former from Jamaica and the latter probably from Cumaná, Venezuela. He stated that the name Bontia germinans L. is typified by Browne's specimen in the Linnaean Herbarium (813.2, filed under Avicennia). The bulk of Browne's plants were purchased by Linnaeus in 1758, according to Spencer Savage (A catalogue of the Linnaean Herbarium, p. vi. 1945). Donatia Loefl. (Iter. Hisp. 193. 1758) was published in a work without binomial nomenclature and apparently was a new name for Bontia, which was cited.

Jacquin in 1760 first placed this New World mangrove in the genus Avicennia. He distinguished two species, A. nitida Jacq. (Enum. Pl. Carib. 25. 1760; reprinted 1762) and A. tomentosa Jacq. (Enum. Pl. Carib. 25. 1760). The latter included an indirect reference to Bontia germinans as "Bontia Linn. syst. A. p. 1122" and another to Rheede. According to Moldenke (Phytologia 7: 185. 1960), Jacquin's types of both species, now in the British Museum of Natural History, represent variations of a single species.

Linnaeus in the second edition of his Species Plantarum (Editio Secunda. 1684 p. Holmiae, 1762-63) in the second volume (p. 890-891) suppressed his genus Avicennia and A. officinalis. Bontia had two species, and Bontia daphnoides (p. 890) of the Antilles now added Jacquin's first species (A. nitida) to the synonymy. B. germinans (p. 891) of the Indies now included a reference to Avicennia in the first edition as "Sp. pl. 1. p. 110", all the citations of A. officinalis from the first edition, Patrick Browne's Latin description, and Jacquin's second species (A. tomentosa). Linnaeus added that he reduced this species from Jacquin's personal observation.

Then Jacquin in his Selectarum Stirpium Americanarum Historia (1763) retained the genus Avicennia with enlarged Latin descriptions of his same two species. A. nitida Jacq. of Martinique was illustrated by a plate showing twig, leaves, fruit, and flower. A. tomentosa Jacq. of the Caribbean and neighboring continent was illustrated by a single obtuse leaf.

References under the second species included Browne, Loefling, and Linnaeus's description of Bontia germinans ("Linn. syst. A. p. 1122"). Jacquin observed that Linnaeus was confused ("confusus"). To point out the differences, he illustrated also the flower and fruit of B. daphnoides (t. 173, fig. 46).

The third edition of Species Plantarum (Editio Tertia. 1682 p. Vindobonae, 1764) followed soon after the second edition (1762-63) and was almost identical. Previously, I had regarded the third edition as a reprint of the second, and so states A Catalogue of the Works of Linnaeus (ed. 2, p. 45. 1933). I have examined two copies of this edition, which Bakhuizen van den Brink cited.

Bontia (p. 890) in the third edition was restricted to its original single species B. daphnoides of the Antilles excluding Jacquin's first species of Avicennia. Linnaeus restored his genus Avicennia (p. 891) with two species, A. nitida Jacq. and A. germinans of the Indies, and now under his Didynamia Angiospermia. A. germinans had almost the same synonymy as B. germinans (1763, not 1759) except for the omission of Linnaeus's descriptive phrase "BONTIA foliis oppositis, pedunculis spicatis." Instead, the first reference cited was "AVICENNIA foliis subtus tomentosis. Jacq. americ. 25. t. 112. f. 2." As before, there were cited "Avicennia. Fl. Zeyl. 57. Mat. med. 42. Sp. pl. 1. p. 110", Browne, Rheede, etc. From the citations, synonymy, and distribution, A. germinans included the Old World plants earlier named A. officinalis L. (1753). The listing of Avicennia in the index remained under Index Synonymorum as in the second edition and was not corrected to Index Generum.

In the sixth edition of his Genera Plantarum (1764), Linnaeus definitely reduced Avicennia Jacq. to synonymy under Bontia (p. 326), as shown indirectly in the second edition of his Species Plantarum (1763). According to the International Code of Botanical Nomenclature (Art. 13, Note 3. 1956), generic names in these two works are associated. The combined generic description of Bontia referred to the seed as "Nux ovalis, unilocularis, germinans." Linnaeus observed that he combined Avicennia and Bontia, both genera viviparous though with different corolla. In this work on genera, the species were not listed.

Then, in the Appendix of the same volume, the sixth edition of his Genera Plantarum (p. 579. 1764), Linnaeus restored and described the genus Avicennia again under his Didynamia Angiospermia. He listed two species, A. tomentosa Jacq. with "Bontia germinans. Sp. pl. 2. p. 891" as a synonym and A. nitida Jacq. of Martinique as removed from Bontia daphnoides. Thus, Linnaeus rejected his own epithet germinans.

Next, in a later edition of Systema Naturae (ed. 12, 2:426-427. 1767) and a reprint (ed.13, 2: 426-427. 1770), Linnaeus accepted Avicennia with 2 species A. tomentosa Jacq. and A. nitida Jacq. and Bontia with only B. daphnoides L. The same three species were accepted also by J. A. Murray (Linné, Systema Vegetabilium ed. 14, p. 579. 1784) and a later reprint (ed. 15, p. 579. 1797).

Finally, in Mantissa Plantarum Altera (p. 423. 1771), a supplement to Genera Plantarum (ed. 6) and Species Plantarum (ed. 2), Linnaeus retained Bontia daphnoides L. in its original circumscription excluding Jacquin's species, and accepted B. germinans excluding his own synonymy.

I wish to report that the binomial Avicennia germinans, which was omitted from Index Kewensis, was adopted also by Patrick Browne in the second edition of his Civil and Natural History of Jamaica (1789), published the year before his death. The first edition (1756) did not employ binomials, while the second edition, almost identical, according to the title page "added complete Linnaean indexes." The binomial Avicennia germinans as the Linnaean name without author appeared twice under Didynamia Angiospermia, on the twelfth unnumbered pages of Index I with Bontia and on the seventh unnumbered page of Index II with reference to Bontia on page 263. Avicennia germinans P. Browne (1789) thus is based upon Browne's description of the olive mangrove tree and his type specimen from Jamaica now in the Linnaean Herbarium (813.2), also the type of Bontia germinans L.

The confusion of the two unrelated genera Avicennia and Bontia by Patrick Browne and Linnaeus was odd. Browne (1756) correctly placed in genera the other three unrelated common species of mangroves in Jamaica. When he assigned his olive mangrove tree from Jamaica doubtfully to the West Indian Bontia, the genus Avicennia was known only from a single Old World species. In 1753-54 and earlier, Linnaeus put the two general in different classes. In 1764 he restored Avicennia from synonymy and placed it next to Bontia under his Didynamia Angiospermia.

Perhaps from Browne, Linnaeus became confused in attributing the viviparous or germinating habit of Avicennia with seeds in flattened greenish capsules to the genus Bontia, which has very different yellow ovoid pointed drupes with very long threadlike styles. Stamens are didynamous in Bontia and equal or subdidynamous in Avicennia. The latter has opposite leaves and flowers with short 4-lobed campanulate white or yellowish corolla, while Bontia has alternate leaves and flowers with longer 2-lipped yellowish corolla tinged with purple. Bontia, which has been called olive, grows as a high shrub along shores near

mangroves but has been planted elsewhere as an ornamental. One wonders if specimens might have become mixed.

Though omitted from Index Kewensis, Avicennia germinans L. was cited as a synonym of A. nitida Jacq. by Bakhuizen van den Brink in his monograph of the genus (p. 218). He accepted for this genus 4 species (1 with 5 varieties), among them A. officinalis L. and A. nitida Jacq. (with A. tomentosa Jacq. as a synonym.

Bakhuizen van den Brink (p. 200) traced the great confusion in the specific epithets to Linnaeus himself. Citing for Bontia germinans L. the 1763 reference as did Index Kewensis, he apparently overlooked the first publication of that name in 1759. He mentioned the "new name Avicennia germinans L." and explained:

"However, in the 3d edition of the Spec. Plant. (1764) p. 281, LINNAEUS ... gave again the generic name Avicennia, uniting Avicennia Flor. Zeyl. from Asia (called in 1753 A. officinalis L.) and Avicennia tomentosa JACQ. from America, under the new name Avicennia germinans L. Since LINNAEUS followed then JACQUIN'S data obviously (and actually had in his mind the American plant), the name A. germinans L. remains, notwithstanding the added quotations about the names of the Indian plants, as synonym to be attributed to A. tomentosa JACQ. from America. This fact was understood by LINNAEUS himself, who in the 6th edition of his Gen. Plant. (1764) p. 579 gave back to the American species its original name Avicennia tomentosa JACQ."

Harold N. Moldenke (The Verbenaceae and Avicenniaceae of Trinidad and Tobago. Lilloa 44: 283-336. 1939) cited as synonyms of Avicennia nitida Jacq. (p. 334) both A. germinans L. and Bontia germinans L. In the latest monograph of the genus, Moldenke(1960) adopted A. germinans (L.) Stearn and distinguished 11 species and a few varieties.

Following Moldenke, J. Francis Macbride adopted the name Avicennia germinans (L.) Stearn in his Flora of Peru (Field Mus. Nat. Hist. Bot. Ser. 13 (pt. 5, no. 2): 721. 1960).

Stearn in publishing the new combination Avicennia germinans observed that this name had been attributed to Linnaeus by Bakhuizen van den Brink and by Moldenke. However, he apparently overlooked the citation and comment by Bakhuizen van den Brink quoted above as well as Linnaeus's publication of this binomial.

The combination Avicennia germinans (L.) Stearn (1958) must be rejected because that binomial had been published twice before by Linnaeus (1764) and by Patrick Browne (1789).

The question to be settled now is the disposition of Avicennia germinans L. (Sp. Pl. ed. 3, 891. 1764). Is this a new name or a new combination? Is this binomial to be rejected or accepted and if so for what species? Bakhuizen van den Brink, quoted above, regarded this as a new name and rejected it. However, now more facts are known, and the rules of nomenclature have been changed.

The binomial Avicennia germinans L. following Bontia germinans L. suggests a new combination because the author repeated the epithet. In new combinations published before 1953, clear indication of the basionym and full reference to author and original publication are not required (Art. 32). In older works where there was no confusion or change in circumscription, some irregular new combinations have been accepted. A new combination based upon Bontia germinans L. (Syst. Nat. ed. 10, 2: 1759) would have the same type (Art. 55). The Code (Art. 55) might permit repetiion of an epithet as a new name in a second genus provided the conscription or type were the same and in spite of a synonym of intervening date in the second genus.

I conclude that Avicennia germinans L. must be regarded as a new name, not a new combination, and must be rejected as illegitimate (Art 64). First, Linnaeus in publishing Avicennia germinans L. (Sp. Pl. ed. 3. 891. 1764) cited neither Bontia germinans L. (Syst. Nat. ed. 10, 2: 1122. 1759) nor Bontia germinans L. (Sp. Pl. ed. 2, 891. 1763) and neither of these two earlier works containing this same epithet.

Likewise, Linnaeus in publishing Bontia germinans L. (1763) did not cite B. germinans L. (1759). As Index Kewensis cited only the later publication, the earlier was overlooked by other authors, for example by Bakhuizen van den Brink (1921), until brought to light by Stearn (1958). Thus, B. germinans L. (1763) could be treated as a new and different name from B. germinans L. (1759) and rejected as a later homonym. Then if Avicennia germinans L. were regarded as a new combination, there would be two possible basionyms. A. germinans has a conscription more nearly like that of B. germinans L. (1763) and with the latter as its basionym would stand as a new name in 1764.

Perhaps the most important evidence is Linnaeus's citation of his own earlier work. In publishing the name A. germinans L. (Sp. Pl. ed. 3, 891. 1764), Linnaeus cited neither reference with B. germinans L. but instead cited: "Avicennia. Fl. Zeyl. 57. Mat. Med. 42. Sp. pl. 1. p. 110." Those three references all are to the Old World species A. officinalis L. (Sp. Pl. 110. 1753), the only species of the genus published in 1753 and thus the type. Therefore, A. germinans L. (1764), which is based partly upon A. officinalis by Linnaeus's own citation, has the

same type, the Indian plant "Oepata" Rheede (1683) with restricted type-locality the coast of Cochin, southern India (Code, Appendix IV, 2, 3d).

A. germinans L. (1764) could not be regarded as a new combination under Article 55 (last paragraph) because Linnaeus deliberately cited a page reference to his different earlier name and at the same time made no reference to B. germinans L. 1759, 1763).

As a new name, A. germinans L. (1764) is illegitimate as nomenclaturally superfluous when published (Art. 64 (1)), because the taxonomic group as circumscribed by Linnaeus included the type of the older name and epithet A. officinalis L. (1753). In other words, Linnaeus when uniting two taxonomic groups from Old and New World should have retained the oldest legitimate name and epithet A. officinalis L. (Art. 57).

So far as I know, Linnaeus accepted A. germinans in only one obscure, overlooked edition of one work. He rejected this binomial in 1764, the year of its publication. The epithet germinans is not distinctive in the genus Avicennia, which was so characterized from the beginning in 1737, though could not be rejected for that reason.

Later authors, such as Willdenow (Sp. Pl. ed. 4, 3: 394-395. 1800) followed Linnaeus in accepting A. nitida and A. tomentosa instead of A. germinans. So far as I know, Patrick Browne was the only author before Stearn to take up A. germinans.

A. nitida Jacq. (1760) has been in almost universal use for about two hundred years. A. tomentosa Jacq. (1760), was published on the same page, is now generally treated as a synonym, being a pubescent variation. I do not know where these names were first united. However, A. tomentosa Jacq. is rejected as nomenclaturally superfluous when published, because its synonym included an indirect reference to Bontia germinans (Art. 64 (1)).

The simplest solution of the confused nomenclature is to regard A. germinans L. (1764) as an illegitimate new name for which A. officinalis L. (1753) should have been used. The specific epithet of Bontia germinans L. (1759) was priority over A. nitida Jacq. (1760) but cannot be reinstated as A. germinans P. Br. (1789) because the latter is a homonym of A. germinans L. (1764) (Art. 55 (1), 64 (2)).

Likewise, A. germinans (L.) Stearn (1958) could not replace A. nitida Jacq. (1760) because of the earlier homonym A. germinans L. (1764) and because of A. germinans P. Br., which is based upon the same type as A. germinans (L.) Stearn.

Thus, Avicennia nitida Jacq., the name in almost universal use for about two hundred years, remains the correct name for black-mangrove. Any attempt to revive the rejected, confused, and almost unused binomial A. germinans would serve no useful purpose. If application of the Code should be doubtful, then the interpretation should favor retention of the name established in usage.

However, as complete agreement may be lacking, the nomenclature merits further attention under Resolution 2, accepted by the plenary session of the Ninth International Botanical Congress, Montreal 1959 (Taxon 8: 245. 1959). This resolution invites persons "to send to the General Committee lists of plant names for w hich stabilization seems important, whether or not these names are now threatened ..." Avicennia nitida Jacq. is the name of an important species for which stabilization seems important and which is now threatened. Therefore, I am submitting this name for consideration. In the meantime, while action at the Tenth International Botanical Congress is pending, the name long established in usage should be retained.

Forest Service, United States Department of Agriculture, Washington, D. C.

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NOTES ON NEW AND NOTEWORTHY PLANTS. XXII

Harold N. Moldenke

CALLICARPA ERIOCLONA var. PAUCINERVIA (Merr.) Moldenke, comb. nov.

Callicarpa paucinervia Merr., Philip. Journ. Sci. 9: 134--135. 1914.

CALLICARPA RANDAIENSIS var. KOREANA Moldenke, var. nov.

Haec varietas a forma typica speciei foliis subsessilibus anguste ellipticis parvis longe acuminatis, ad basin cuneato-acuminatis, supra basin minute adpresso-serrulatis utrinque glabris recedit.

This variety differs from the typical form of the species in having the leaves thin-membranous, very small, 2--4.5 cm. long, 7--14 mm. wide, narrowly elliptic, long-acuminate at the apex, cuneate-acuminate at the base, finely appressed-serrulate from below the middle to the base of the terminal acumination, glabrous on both surfaces.

The type of the variety was collected by Hyon Pia Chong at Wan-Do, Korea, on October 29, 1950, and is deposited in the herbarium of the University of California at Berkeley. The Korean name is said to be "chhom-chaksal-namu".